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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/824,420	04/15/2004	Masaaki Matsushita	03500.018071	6474
5514 7590 05/14/2008 FITZPATRICK CELLA HARPER & SCINTO 30 ROCKEFELLER PLAZA NEW YORK, NY 10112				
EXAMINER				
TRINH, THANH TRUC				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
05/14/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/824,420

Applicant(s)

MATSUSHITA ET AL.

Examiner

THANH-TRUC TRINH

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7 and 8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7 and 8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CDC)
- Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/27/2008 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites limitation " " in line 16. The meets and bounds of this limitation cannot be determined as to what degree of flexibility is referring to.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claims 1 and 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchihashi et al. (US Patent 5951785) in view of Tran et al. (EP 1205982).

Regarding claim, as seen in Figures 1, 16 and 18-25, Uchihashi et al. discloses a solar cell module 1 (1 as seen in Figure 1; 1c in Figures 18-19, 21; and 1a in Figure 25) having a photovoltaic section 11. Each photovoltaic section 11 comprises a plurality of photovoltaic cells 11a (as seen in Figure 1) in inner part and composes of tempered glass on the light receiving surface and a slate plate 50 on the other side. A portion 50b of slate plate 50 extends beyond the photovoltaic section 11 for mounting a converter 2. (See col. 10 line 48 to col. 11 line 38). The electrical output of the photovoltaic section 11 connecting to the converter 2 is covered by EVA resin 53d and cover film 53e. (See Figure 24 and col. 12 lines 13-33). Uchihashi et al. also describes that the solar cell modules 1 can be arranged side-by-side as seen in Figure 16. As the modules 1 with converter 2 arranged side-by-side, the structure of Uchihashi et al. comprises a plurality of solar cells (photovoltaic cells 11a as seen in Figure 1) covered with a covering

member (including slate plate 50, covering resin and film 53d and 53e as seen in Figure 24); a plurality of power converters (2). The plurality of solar cells forms a plurality of solar cell groups (or a plurality of modules 1) comprising two or more solar cells with a gap therebetween (or the line between modules 1 as seen in Figure 16). Uchihashi et al. is silent about the solar cells electrically connecting to each other, however there must be an electrical connection between solar cells so as together they can have an output as described in the Abstract. Uchihashi et al. also describes each converter (2) arranged at the edge of the solar cell module and in the middle of portion 50b of slate plate 50 as seen in Figures 18 and 21, therefore the converters are arranged out of an extension line of the gap. Each converter 2 is connected to an output of a solar cells group or module 1 as seen in Figures 23 and 24. Uchihashi et al. also describes a plurality of photovoltaic modules 1 which includes the converters 2 can be connected in parallel (See col. 6 lines 9-11), therefore the output of the respective power converters are all connected in parallel to each other since only the power converters 2 have the availability for connection. Uchihashi et al. further teaches that in general a photovoltaic module is formed to have suitable dimensions in order to make the manufacture thereof easy and make transportation to the location thereof easy (See col. 1 lines 17-25). Therefore it is also the Examiner's position that the entirety of the solar cell module has flexibility.

Uchihashi et al. does not teach a plurality of converters provided on a surface of the covering member.

Tran et al. teaches using a module carrier panel (3) as seen in Figure 6 to support multiple solar modules 4. (See Abstract)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the module of Uchihashi et al. by having a single covering member (or module carrier panel) that covers multiple solar modules (or solar cell groups) as taught by Tran et al., because it would provide a support for accommodating multiple solar modules. (See Figure 6 and Abstract).

Regarding claim 3, Uchihashi et al. describes the photovoltaic modules 1 with converters 2 connecting in parallel (See col. 6 lines 9-11). Uchihashi et al. also teaches the connecting elements can be fixed to section 50b of the covering member 50 by EVA resin 53d and further coated with cover film 53e as seen in Figure 24, or buried in the EVA resin 53d and cover film 53e. Therefore it would have been obvious to one skilled in the art to have the wiring member electrically connecting the outputs of respective ones of the plurality of power converters is buried in the covering member.

Regarding claims 4-5, Uchihashi et al. describe the plurality of power converters is placed on a light-incident surface side of the covering member (50b and 53d-e). (See Figures 18-19 and 21-25). Uchihashi et al. also describes each converter (2) arranged at the edge of the solar cell module 1 and in the middle of portion 50b of slate plate 50 as seen in Figures 18 and 21. It is the Examiner's position the power converters (2) is placed at a position where a total length of a plurality wiring connecting inputs of the power converters to outputs of the plurality of solar cell groups is shortest.

2. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uchihashi et al. (US Patent 5951785) in view of Tran et al. (EP 1205982) and further in view of Geissler et al. (US Patent 4443840).

Uchihashi et al. and Tran et al. disclose a solar cell module with converters as described in claim 1.

Neither Uchihashi et al. nor Tran et al. teaches the power converters are DC-DC converters that step up a DC voltage output from the solar cells.

Geissler et al. teach the power converters are DC-DC converters that step up a DC voltage output from the solar cells. (See "Summary of the Invention")

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the module of Uchihashi et al. and Tran et al. by using DC-DC converters as taught by Geissler et al., because it would transform up the low input voltage of solar cells. (See col. 2 lines 50-54)

3. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uchihashi et al. (US Patent 5951785) in view of Tran et al. (EP 1205982) and further in view of Shiomi et al. (US Patent 5998729).

Uchihashi et al. and Tran et al. disclose a solar cell module with converters as described in claim 1. Uchihashi et al. also teaches the photovoltaic cells within the solar cell module having electrodes for connecting (See col. 5 lines 29-31)

Neither Uchihashi et al. nor Tran et al. specifically teaches that the solar cells comprises a first solar cell having a first pair of electrodes and a second solar cell having a second pair of electrodes, wherein one of the first pair of electrodes is connected to one of the second pair of electrodes.

As seen in Figures 5-6, Shiomi et al. teaches an array of solar cells (or block of solar cell 101) comprising a first solar cell 110 (for example, the one on the left) having a first pair of electrodes (120 and 122) and a second solar cell (the middle one) having a second pair of electrodes (120 and 122), wherein one of the first pair of electrodes is connected to one of the second pair of electrodes by connection 111.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the module of Uchihashi et al. and Tran et al. by having one of the first pair electrodes of the first solar cell connected to one of the second pair electrodes of the second solar cell as taught by Shiomi et al., because it would provide a series connection among the solar cells (See col. 5 line 57 to col. 6 line 9) and it also is suggested by Uchihashi et al. to have electrodes on solar cells for connecting.

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uchihashi et al. (US Patent 5951785) in view of Tran et al. (EP 1205982) and further in view of Yang et al. (1994 IEEE First World Conference).

Uchihashi et al. and Tran et al. disclose a solar module with power converters as described in claim 1.

Neither Uchihashi et al. nor Tran et al. teaches the solar cells comprising stacked solar cells having an amorphous microcrystal silicon type three-layer structure.

Yang et al. teach using stacked solar cells having an amorphous microcrystal silicon type three-layer structure. (See Figure 1, Component Cell Optimization and Improvement of The "Tunnel" Junction)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the solar cell module of Uchihashi et al. and Tran et al. by using stacked solar cells having microcrystal silicon type three-layer structure as taught by Yang et al., because it would improve the cell performance. (See Abstract of Yang et al.)

Response to Arguments

Applicant's arguments filed 1-8 have been fully considered but they are not persuasive.

Applicant argues that none of the reference teaches the new limitation of "wherein the entirety of the solar cell module has flexibility". The Examiner respectfully disagrees. First of all, the meets and bounds of the new limitation cannot be determined. It is unclear to what degree of flexibility the limitation referring to. Secondly, Uchihashi et al. teaches the photovoltaic module in general has suitable dimensions to make the manufacturing and the transportation of the modules easy (See col.1 lines 17-25 of Uchihashi et al.). In the broadest reasonable interpretation of the limitation, the

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Examiner considers this teaching corresponds to the limitation of "the entirety of the solar modules has flexibility" of the instant claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh-Truc Trinh whose telephone number is 571-272-6594. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TT

4/11/2008

/PATRICK RYAN/

Supervisory Patent Examiner, Art Unit 1795